

PATENT CLAIMS

1. Method for the production of salt melts, and mixtures thereof, of the general formula



5 in which

D is Al or Fe,

characterised in that, in a first reaction step (i), a melt of aluminium or iron is reacted with chlorine gas to give gaseous metal halide (DCl_3), and this is subsequently, in a second reaction step (ii), reacted with
10 solid sodium chloride to give the corresponding compound of the formula (I) and is separated off as a melt.

2. Method according to Claim 1, characterised in that the reaction in the second reaction step (ii) is carried out with a mixture of sodium chloride and solid metal granules or powder (D), where the metal (D)
15 is reacted, in a further reaction step (iii), in the melt with any HCl formed to give the corresponding metal chloride (DCl_3).

3. Method according to Claim 2, characterised in that the chloride formed as by-product in reaction step (iii) is converted into the compound of the formula (I) by reaction with solid alkali metal chloride in
20 a downstream reaction step (iv) and separated off as a melt together with the majority of the compound of the formula (I) formed after reaction step (ii).

4. Method according to one of Claims 1 to 3, characterised in that the energy being liberated during the reaction of the metal with chlorine
25 gas is utilised for the subsequent reaction with NaCl to give the product.

5. Method according to one of Claims 1 to 4, characterised in that the reaction is carried out continuously.

6. Method according to Claim 5, characterised in that the relevant metal D and the said mixture of metal D and sodium chloride is in each case added in solid form continuously corresponding to the amount of end product formed and separated off.
- 5 7. Device for carrying out the method according to one of Claims 1 to 6, essentially consisting of a reaction vessel (1) containing the melt of the metal D, having a feed device for chlorine gas (2), a collection device for gaseous metal chloride (4) above the reaction vessel (1), and a further reactor vessel (5), which contains sodium chloride in solid form and is connected to the said collection device.
- 10 8. Device according to Claim 7, characterised in that a solids metering unit (3) is provided which contains the metal D in powder or granule form and is connected to the reaction vessel (1).
- 15 9. Device according to Claim 7 or 8, characterised in that the gas feed to the reactor vessel (5) takes place between the upper quarter and the centre of the reactor vessel.
- 20 10. Device according to one of Claims 7 to 9, characterised in that a solids metering unit (6) is provided which contains a mixture of solid sodium chloride and metal D in powder or granule form and is connected to the reactor vessel (5).
- 25 11. Device according to one of Claims 7 to 10, characterised in that a further reactor vessel (7), which contains solid sodium chloride, is installed downstream of the reactor vessel (5).
12. Use of the device according to Claims 7 to 11 for the production of salt melts of the formula (I) for electrochemical cells, batteries, storage media in heat storage systems, for covering and cleaning molten metals and for the electrocoating of materials.